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[FROM THE NEW ENGLANDER AND YALE REVIEW FOR SEPTEMBER, 1888.]

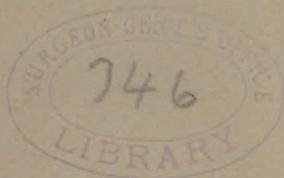
SOME OF THE ADVANTAGES OF THE UNION OF
MEDICAL SCHOOL AND UNIVERSITY.

AN ADDRESS DELIVERED AT YALE UNIVERSITY, JUNE 26TH, 1888,

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Professor of Pathology in Johns Hopkins University.



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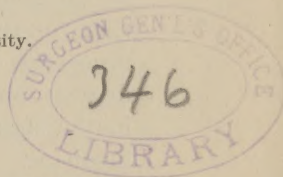
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It is a hopeful and gratifying circumstance that within the last few years universities in this country and in England have shown an awakened and enlightened interest in the advancement of medical science and the promotion of higher medical education. Among the most notable evidences of this interest is the recent organization at the great Universities of Oxford and of Cambridge in England of medical departments, not as detached schools, but as integral and coördinate parts of the university. The vivifying influence of this intimate connection between medical study and the university has made itself manifest in zeal for research, equipment of laboratories, improved methods of instruction, and a more orderly and systematic scheme of study.

If I mistake not the significance of the present occasion there are here in Yale University intelligent appreciation of the great purposes to be accomplished by promotion of the best medical education and a desire to render the medical department not less efficient than the other departments of this university.

The present occasion seems an appropriate one to consider some of the relations of medical education to the university.

In this country and in England medicine is taught chiefly in independent professional schools without any connection or with only a nominal connection with a university. An important distinction exists between the independent medical schools of the United States and those of Great Britain, in that our schools have the power of granting degrees, whereas medical degrees and licenses to practice medicine can be obtained in Great Britain only by passing examination at the universities or before the examining boards of certain corporations. The assumption by independent schools of medicine of the power of granting the doctor's degree, without any control from a university or from the State, is a main reason in this country for the lack of uniformity in medical education, for the enormous number of medical schools beyond all necessities of the community, for the ease with which medical degrees can be obtained, and for the consequent degradation in the significance and the value of the degree of doctor of medicine.

These and other evils of the system of medical education prevailing in this country, are widely appreciated and generally deplored by all who take an enlightened interest in the advancement of the science and art of medicine. They were made the subject of a vigorous address by the president of the American Medical Association at its last session. Probably none recognize more clearly the need of reform than many of the teachers in the best of our medical schools. In general they are to be credited with the desire to accomplish all that is possible in the face of such serious obstacles as the absence of endowments, and the consequent necessity of entering into competition with bad and indifferent schools. The introduction of requirements regarding preliminary education,

the lengthening of the period of study, and the establishment of suitable laboratories in several of our medical schools are among the evidences of this desire for reform.

It is not my purpose on this occasion to discuss the serious defects of medical education in this country, or the remedies for their removal. I have called attention to these defects in order to emphasize the widely recognized need for improvement, and the appreciation and support which would be accorded by the medical profession to intelligent efforts to advance the cause of medical education.

While not denying that the essential purposes of medical education can be attained by properly directed independent schools of medicine, I wish to point out some of the peculiar advantages and higher aims which should be associated with a medical department existing in intimate union with the other faculties of a university. To accomplish these purposes and to attain these aims, the medical department should not be dependent for its existence, merely upon the fees of students, but it should receive aid from the State, or better and more in accordance with the prevailing ideas concerning the support of higher education in this country, it should be amply endowed. To this fundamental point I shall return after indicating some of the especial benefits to be expected from such endowment.

Appeal might be made to history to illustrate the beneficial influence of the university upon the development of medicine. We should find in the University of Alexandria the highest development of medicine in antiquity, in Salerno, Civitas Hippocratica, the dawn of mediæval universities, in Montpellier, Bologna, and Padua, the overthrow of scholasticism in medicine and the revival of scientific investigation, in Leyden the complete adjustment of medicine to the new conditions, brought about by the overthrow of Galenism and by the discoveries in anatomy and physiology, above all by the discovery of the circulation of the blood by Harvey. From Leyden we could trace influences which have affected the organization and the methods of instruction in the leading medical schools of Europe.

But interesting as it might be to follow this historical path,

it is more pertinent to my present purpose to direct attention to existing conditions. What does the present state of medical education and science teach as to the best system of medical education?

It will doubtless be admitted by all whose knowledge enables them to form a competent judgment on the subject, that Germany to-day occupies the leading position in medical education and in medical science. Our own country has produced great physicians whose names are everywhere esteemed. It has contributed an honorable share to the advancement of the art of healing. The production of distinguished physicians, scientific investigation in all branches of medicine, the successful pursuit of the healing art are not the exclusive possession of any race or of any country. While all this is true, it must still be granted that in German universities (including those of Austria, Switzerland, and Russia) we find the most satisfactory and thorough teaching, and the most numerous and important discoveries in medicine. Every year a large number of medical students and physicians from this country visit these universities to find there advantages not to be obtained here.

If we attempted to analyze the causes of German preëminence in medical education, we should find that many causes combine to produce this result, but certainly not the least of these is the fact that medicine in Germany is taught only as a department in a university. Independent medical schools do not exist there. Something more than a feeling of piety for old forms has preserved the historic association of the medical with the other faculties. There is a conviction that the highest interests of medical education and science are best subserved by this association. This conviction is apparent in most of the German literature on medical education, and has been forcibly brought out in the discussions aroused by the proposal to establish in Austria one or more conjoint medical and scientific faculties in order to relieve the monstrous attendance of students in the medical department of the Vienna University.

I have not adduced the status of medical education in Germany in order to make propaganda for the transference to

our soil of German university methods. Here, as elsewhere, systems of education must be adapted to the special conditions of the country. There is no reason to suppose that the especial conditions of a German university are essential for the fructifying influence of the university upon medical education. In the University of Cambridge, England, there has developed under Michael Foster a school of physiology, which is clearly traceable to academic influences and which is an honor alike to the university and to English medicine. We should not be justified in supposing that such results can not be obtained under favorable conditions by independent medical schools, but experience demonstrates that the highest development of medical education is attained to-day as it has been in the past by the university system.

It is doubtless not essential to the conception of a university that it should comprise all of the four traditional faculties. This union, however, belongs to the historic conception of the university and adds to its completeness. We may rejoice that Yale University by conforming to this historic conception, has and will continue to have a larger measure of usefulness and honor. With adequate pecuniary support of the medical department, there is every reason to believe that the association of medical studies with this university will prove no less beneficent for medical education, no less fruitful for medical science than such association has proved in the instances which have been mentioned.

It is hardly necessary to say that these benefits are not the result of a merely formal connection of a medical school with a university. There are examples enough of this purely outward and nominal connection to show that this brings with it no saving power. There must be a union in spirit as well as in name. The influences of university methods and idea must manifest themselves in the medical department, sympathetic relations must exist with other departments through the connecting link of all, the philosophical faculty, and the coöperation must be obtained of those physical and natural sciences, physics, chemistry, zoölogy, comparative anatomy, and botany, knowledge of which is essential to a complete medical education and to scientific research in every branch of medicine.

From what has been said, we may conclude that there is great need for improvement in medical education in this country, that there is wide-spread demand for reform, and that experience has shown that the best results are obtainable by a well supported medical school in vital union with a university.

I wish now to point out more specifically some of the advantages which belong to the university system of medical education.

In the first place this system may be expected to maintain the proper balance between purely technical training in the medical art and cultivation of the medical sciences upon which this training should be based, or to express the same idea perhaps more intelligibly, although in somewhat crude and much abused terms, between the practical and the scientific side of medicine.

It is evident that the study of practical medicine should be preceded by the study of the structure and functions of the human body in health. What the body is and what it does in health must be known before there can be any understanding of what it is and what it does in disease. The normal and peaceful workings of nature must be comprehended before its disordered manifestations can be understood. Effectual and intelligent measures to prevent and to relieve disease, must be based upon the knowledge of the causes of disease and of the structural and functional disorders produced by disease. Anatomy, physiology, and pathology then must form the foundation of any substantial system of medical education. To any one who is familiar with the present state of these fundamental sciences, it must be clear that they can not be successfully taught and intelligently studied without thorough knowledge of physics, chemistry, and general biology.

Human anatomy must be pursued in the light of embryology and of comparative anatomy. It then becomes a fascinating study, full of meaning, instead of a mass of unrelated facts to the significance of which there is no clue. Physiology is in large part the application of physics and chemistry to the explanation and the investigation of the bodily

functions in health. To the employment of physical and chemical methods, physiology owes its position as the most exact of the medical sciences. "Physiologists," says Du Bois-Reymond, "should regard themselves as chemists and physicists who work only in a particular direction." Pathology, with its two divisions, pathological anatomy and pathological physiology, aims to discover the alterations in structure and in function induced by disease, and it requires no less than do normal anatomy and physiology the assistance of the biological, physical, and chemical sciences.

It is not necessary to elaborate here in detail all of the bearings of these sciences upon medicine. Enough has been said to make plain, that a good system of medical education must include thorough instruction in anatomy, physiology, and pathology grounded upon the natural and physical sciences. While this is generally conceded it is not the less true that these scientific branches of medicine do not receive the attention which they deserve in this country. With few exceptions, the instruction provided in our medical schools in these subjects is very defective, and the opportunities for their practical study meagre.

In a medical school permeated by the university spirit, and in intimate association with a university, these sciences can not fail to receive proper recognition. It is their presence in the medical curriculum which renders particularly appropriate the incorporation of a medical faculty in a university. They are capable of imparting to the study and the practice of medicine the intellectual enjoyment of scientific investigation. Universities have always kept alive the ideal that the interests of life are not wholly material, but that they are spiritual and intellectual as well. May the time never come when this ideal shall be replaced by the estimate of knowledge, solely for its commercial value, or its immediate application to the practical necessities of life. Somewhat of this true university ideal should pervade medical study, if the practice of medicine is to be a profession and not a trade or a handicraft.

In a university medical school of the character indicated, we may look then for the highest cultivation of the medical sciences. These sciences will not be estimated solely by their

immediate or apparent practical bearings. With the scientific spirit thus engendered, we may expect to find an elevation of tone and a lofty ideal conducive to a high standard of education and fruitful in the best results for the character, the attainments, and the standing of the medical profession. Such a school in this country would give an impetus to higher medical education and would be an example and an incentive to other medical schools. It is of course not claimed that the results here indicated are possible only in a medical school in a university, but it will not be denied that the atmosphere of a university is particularly favorable for their attainment.

As already intimated the study of the scientific branches of medicine is to be in preparation for the study of practical medicine. The ultimate aim of medical education is and always should remain the prevention and the relief of disease. The scientific training has been emphasized, because it is the best preparation for practical medical studies. It is a narrow and short-sighted view which fails to recognize the essential importance in medical education of the study of the medical and related natural sciences. Before this audience there is no necessity of entering into any argument in opposition to such a view.

The development of scientific and of practical medicine during the last half century, has been so immense that the number and the extent of subjects to be mastered by the medical student are far greater than formerly and are constantly increasing. It is a matter for serious consideration, how to distribute these subjects in a medical course, so that each shall receive its proper share of attention. This occasion is not a suitable one to discuss this question, but in view of the emphasis which I have given to the study of the scientific subjects, and that there may be no misconception, I would say that, in my judgment, the last two years of a medical course should be given mainly to the study of the practical branches of medicine. This study I would have more practical and demonstrative than it is with us at present. Systematic lectures on the theory and practice of medicine and of surgery, could be in large part and with advantage replaced by clinical instruction and by recitations from text-books. A

little more than two hundred years ago, Sydenham replied to the physician who asked him what medical authors he should study, "Read Don Quixote." Such a reply would not be appropriate at the present day, when the abundance of excellent medical text-books renders no longer necessary mediæval methods of teaching.

A shorter period of medical study than four years seems to me possible only with a preliminary medical training such as is already furnished with excellent results in some of our universities and with a supplementary experience in a hospital.

Among the benefits to be expected from the vital union of a well endowed medical school with a university should be mentioned the encouragement of research. I am aware that this expression, encouragement of research, has become a catchword in many of our universities, playing with us much the same rôle as the *akademische Lehr- und Lern-Freiheit* in German universities. A high authority has been recently reported as saying that the encouragement of research embodies one conception of a university, and that this is the conception of a German university. How often from state and university authorities in Germany has protest been made against such an assumption! The encouragement of research is not the primary and fundamental conception in the organization and conduct of a German university, nor do I suppose such a conception to be the true university ideal. But *academia* and *schola* should be united in a university, and no one will question that in a place where the highest education in all branches of knowledge is sought and found, the conditions should be rendered favorable for productive activity in the search for truth.

Let medical education be brought under the academic influences of a university, and let well equipped and properly supported laboratories be supplied, then zeal for original investigation will surely be developed, bringing renown to the university and progress to medical science. Whoever has a patriotic interest in seeing this country contribute its proper share to the investigation and solution of the great problems which engage the thought of the medical world, greets with especial cordiality all intelligent efforts to develop in our

medical education the scientific spirit and to increase the facilities for independent research.

A distinguished professor of physiology in a German university, asked me not long ago: "What becomes of the young men from your country who work in our medical laboratories? While here they do good work and show an aptitude and capacity for scientific investigation, certainly not less than our native students. But after their return to America, we hear no more of them." I was obliged to explain to him, that the facilities and encouragement for carrying on scientific investigations in the medical institutions of this country are in general very meagre, and that one great impetus to such work is almost wholly lacking here, namely, the assurance or even likelihood that good scientific work will pave the way to an academic career. "When America does wake up to the necessity of these things," he replied, "then let Europe look to its laurels."

We are waking up to this necessity. An intelligent and wide-spread interest in this direction has been aroused. Witness the handsome bequests within the last few years for medical education, and the establishment of laboratories in many of our medical schools. The time is ripe, and who that has at heart the extended usefulness and the glory of this great university would not rejoice to see Yale in the van of this movement for higher medical education, and the advancement of medical science in this country.

The study of medicine offers now the attractions of a natural science. This is doubtless one of the reasons why an increasingly large number of young men who have had a liberal education select the medical profession. The problems which await the scientific mind which comes armed with physics, chemistry, and general biology, are not only in themselves of the greatest interest, but they relate to the welfare of humanity. Dogmas and exclusive systems of doctrine can no longer find a place in scientific medicine any more than in physics or chemistry. We seek the truth for its own sake, wherever and however we can find it.

In the nature of things the only side of medicine of much interest to the general public is the treatment of disease.

There is, however, in all departments of medicine a vast body of scientific truth the immediate application of which to the treatment of disease is not at present apparent. The medical sciences are in themselves and for their own sake as legitimate and worthy objects of pursuit as any other of the natural sciences. It is no less true here than it is in chemistry, physics and other sciences that discoveries of the utmost practical importance are made by those who do not select as their guiding principle the practical application of their work. A multitude of instances might be cited to show that those who work in laboratories and without any thought of the possible usefulness of their discoveries contribute to better means of diagnosis and of treatment of disease as well as do the physician and the surgeon in the hospital.

If the general public better understood the rapid advances of medicine and of surgery during the last half century and clearly appreciated the far reaching importance for the preservation of health and the relief of disease of subjects which in all departments of medicine now engage attention, I believe that there would be no lack of means for the best medical education and for the prosecution of medical investigations in this country.

Herophilus said that the best physician is he who knows the possible from the impossible. There is truth in this saying, but many things which were impossible to the physician in the days of Herophilus are possible now, and who shall say what is impossible for those who are to follow us.

Consider for a moment the immense progress which has been made during the last few years in our knowledge of the causation of infectious diseases, those most terrible scourges of mankind. Who could have foreseen that the little vegetable organisms which were studied over fifty years ago so minutely by Ehrenberg were destined to become so important to the physician and surgeon. Among them to-day we recognize the specific causes of tuberculosis, of leprosy, of Asiatic cholera, of typhoid fever, of relapsing fever, of malaria, of erysipelas, of traumatic infections, and of a number of other diseases of human beings and of animals. Even the chemical substances by the production of which these microscopic organisms poison the system have in some instances been isolated in a crystalline

form. Some time ago a work on lock-jaw was introduced by the legend, *causa obscura, vis notissima est*. To-day we can say that there is no disease the cause of which is better understood, for we know not only the living germ which produces traumatic tetanus but also the habitat of this germ and the chemical substance by the production of which its destructive agency is effected.

It would be rash to attempt to forecast the practical importance of these discoveries. Already they have led to such modification and perfection of surgical methods that the infection of wounds from the exterior may be rendered impossible. Antiseptic surgery is a boon to humanity of not less value than the introduction of vaccination and the discovery of anaesthetics.

The discovery of the causative agents of a number of infectious diseases and the possibility of studying the characters of these agents, the conditions favorable and those hostile to their development have proven of great service to public hygiene and have stimulated increased interest in this most important subject. The establishment of hygienic laboratories in the leading universities of Germany is traceable in large measure to the recognition of the importance of bacteriology in the study of epidemic diseases and in other matters pertaining to public health.

The value of a well equipped hygienic laboratory to a community is well illustrated in Munich. In the admirable hygienic institute in that city are studied under Pettenkofer's direction questions relating to sewage, drinking water supply, ventilation, the construction of slaughter houses, and similar subjects. Public spirit has there been stimulated and so intelligently directed that the sanitary arrangements of Munich are now among the best on the continent of Europe and the city has been transformed under adverse natural conditions from among the most unhealthful to one of the most healthful. The professor of pathology there complains that he is no longer able to demonstrate to the student the lesions of typhoid fever.

The study of hygiene has become so specialized that degrees in public health are now given in England and the demand is made that medical health officers shall possess such diplomas as

evidence of special training for their duties. I am not aware that in this country opportunities are afforded for the study of hygiene in a manner at all commensurate with its modern development and importance. We may expect, however, that with increased facilities for higher medical education hygienic laboratories will be established which shall meet the demands of the times.

I have selected the recent discoveries in the causation of infectious diseases as it seems pertinent to my purpose before an audience not composed wholly of medical men to illustrate the progress of medicine. It might be useful to indicate still further the character and the importance of subjects which are now prominent in the different departments of medicine but time bids me return to the more direct elucidation of my theme.

I wish now to call attention to a very practical advantage in making a medical school a department of a university. This advantage relates to economy of organization. A university provides for the study of certain subjects which either are included in a medical course or should be required in a course preliminary to the study of medicine. The most important of these subjects are chemistry, physics, botany, zoology, and comparative anatomy. These subjects are included in the medical course in Germany, where they form the major part of the first two years' study in preparation for the *examen physicum*. They are studied, however, in the philosophical and not in the medical faculty.

In the medical schools of this country no provision is generally made for the study of these sciences with the exception of chemistry, and there is probably no more unsatisfactory feature in our medical courses than the teaching of chemistry. As a rule the instruction is chiefly in inorganic and organic chemistry. Physiological chemistry in the modern acceptation of the term is taught scarcely at all, nor can it be to advantage without preliminary training in inorganic and organic chemistry. There is of course just as much propriety, but no more, in including inorganic and organic chemistry in a strictly medical course as in including physics, botany, and comparative anatomy. If a medical school provides for instruction in inorganic and organic chemistry, it should also

make provision for these other subjects. This would involve duplicating at great expense institutes already amply provided for at universities, and it is not likely that such institutes in exclusive dependence upon a medical school would flourish.

There is no doubt that the sciences under consideration belong to the general scheme of medical education. If they be included in the curriculum of a medical school as is the case in Germany and imperfectly so in this country, there is the strongest reason that the medical school should be associated with a university where adequate provision is made for their study. The small measure of success attending the study of inorganic and organic (excluding physiological) chemistry in our medical schools does not encourage us to hope that the establishment of institutes for the study of other physical and natural sciences under similar conditions would yield better results. The school of medicine in Paris is essentially independent of the other faculties of the university and supplies its own professorships of physics, chemistry, and the natural sciences. With reference to this arrangement, Du Bois-Reymond, one of the greatest living physiologists, says, "To the training of the French medical students in the natural sciences by lectures *ad hoc*, although often held by the most excellent men, to their nurture in the atmosphere of a practical professional school in which physics and chemistry are called *sciences accessoires*, I am inclined to attribute the backward position in which, in spite of the appearance of such a man as Claude Bernard, the study of physiology in France, in comparison with Germany, has in general remained."

There have been established within recent years in our colleges and scientific schools, courses of instruction which are intended to be preliminary to the study of medicine, and which are admirably adapted for their purpose. These courses, which, so far as my knowledge extends, are somewhat peculiar to this country, give promise of great usefulness and should receive every encouragement. They are the natural outgrowth on the one hand of the defects in our system of medical education, and on the other hand of the direction in which our colleges have developed.

Here I can not refrain from expressing the hope that these

courses preliminary to the study of medicine may be recognized in the academic as well as in the scientific departments of our colleges. I am well aware that here I am treading upon dangerous ground. In support of this proposition I would present the following considerations.

If a young man choose the medical profession he should devote at least four years to medical studies including the preliminary sciences. One who has had a liberal education will probably supplement this with a year and a half in hospital experience, the value of which can not be overestimated. He is likely then to devote himself for a year or two to special professional studies, often in a foreign university. If this course of professional study, which is not longer than many pursue, is begun at the age when most young men are now graduated from our leading colleges, then he will not be able to enter upon the active duties of his professional life before thirty years of age or thereabouts. When one considers the long period of waiting and struggle before a successful practice is secured, it will be generally admitted that this is altogether too advanced an age for the beginning of active professional work. I know of instances where this consideration has stood in the way of young men enjoying the benefits of a college course. This condition of things has also proven a serious obstacle to lengthening the period of professional study, a reform which is imperatively demanded.

Doubtless, as has been recently suggested by President Eliot, improvements should be made in the primary and preparatory schools so that the average age of admission to college may be lowered, without materially diminishing the requirements for admission. If, in addition to this, the last two years of the college course can be devoted mainly to studies bearing directly upon medical education, the evil here depicted would be largely overcome. These studies are not professional. They belong in themselves to a liberal education and are best pursued without reference to their practical bearings. They therefore appropriately find place in the college curriculum. It may be that such a plan as that suggested is contemplated here. It would seem that with possibly some increase in the opportunities for biological studies such a scheme would in-

volve no radical changes in the present course and would be in the line of development of the college.

To return after this digression to our subject, it may be said that even if chemistry (with the exception of physiological chemistry), physics and the biological sciences before mentioned should be relegated wholly to the so-called preliminary medical courses, it would remain no less desirable that the medical school should be united with the university. The relation of medicine to these sciences is too intimate to suffer divorce from them without detriment. Suitable provision for the study of the preliminary medical sciences in a university is in itself a condition most favorable for the development in the same atmosphere of a medical school. It would often happen that a student finds it necessary to make up some deficiency in one or another of the natural sciences, while pursuing his medical studies, and opportunity for this conjoint study, for which other occasions would also arise, should be present. In the relation, then, of medicine to certain of the natural and physical sciences is to be found one of the most important advantages of the association of a medical school with a university.

Physiological psychology is a subject which should be mentioned as pertaining to medicine as well as to philosophy. Its successful cultivation requires the aid of physiology, anatomy, and psychiatry. Opportunity for the pursuit of this subject should be afforded to those engaged in medical studies. Psychology, however, belongs to the philosophical and not to the medical faculty. This affords another illustration of the mutual benefit resulting from the association of these faculties. We may also expect this association to further the study of the history of medicine, a subject which notwithstanding its interest and value is much neglected. Nothing is more liberalizing and conducive to medical culture than to follow the evolution of medical knowledge.

Finally it may be urged with propriety that a medical department under the administration of a university is a more suitable object for endowment and is more likely to receive bequests of money than are most of our independent medical schools. Those who are acquainted with the organization of these independent schools will not find it difficult to understand

why so few endowments in support of medical education in this country have been given.

The first large pecuniary bequest in behalf of medical education in this country was made by Johns Hopkins. This has been recently followed by the Vanderbilt gift to the medical department of Columbia College in New York and by several similar bequests chiefly for the construction of laboratory buildings.

There is no department of higher education which to-day in this country stands so much in need of pecuniary endowments as that of medicine. The relation of medical education to the public welfare renders especially urgent its claims in this regard. A system of medical education in accordance with modern ideas and adapted to present demands can not be maintained without endowment or State aid. More is required than didactic and clinical lectures and the simple appliances of former times. There is need of thoroughly equipped laboratories, which, if properly conducted, can not be made self-supporting. In most of the German universities nearly three times as much money is paid for the support of the laboratories required by the medical faculty as is given in salaries to the medical professors. The medical school must be lifted above the necessity of obtaining its means of existence solely from the fees of students, if a high standard of education is to be attained. At present it would be suicidal for an unendowed medical school to adopt an ideal course of medical instruction. Under present conditions such a school is likely to make its requirements no higher than is demanded by the students themselves.

The manifold benefits which I have attempted in part to depict as resulting from the union of medical school and university can not be secured to any appreciable degree without endowment.

I can not conclude this address without saying a few words concerning the advantages which this university presents for the development of medical education along the lines which have been suggested. Here in my judgment are conditions most favorable for the development of a university school of medicine which shall meet modern demands. The only doubt which can arise on this point in the mind of any one is whether

there is a sufficient number of patients for clinical instruction. This doubt is not justified by the facts. Of the twenty universities in Germany, all with medical faculties, thirteen are in towns with smaller population than that of New Haven. In this list are included such famous medical schools as those of Bonn, Göttingen, Greifswald, Heidelberg, Tübingen, Würzburg. This comparison does not lose all force even if allowance be made for the special conditions which favor a relatively larger attendance of patients in the German hospitals. A growing city of 80,000 inhabitants should furnish material adequate for the essential needs of clinical instruction. I am informed by those in a position to know that there is sufficient material here for thorough clinical teaching.

Certainly it is desirable to have as large clinical material as possible, but it is an error to suppose that medical schools can flourish only in connection with large metropolitan hospitals. Even for clinical instruction there are not a few advantages associated with the smaller medical schools. Billroth, one of the most distinguished clinical teachers living, advises medical students to avoid the large and crowded universities, and that too in order to obtain their early clinical instruction. Clinical teaching does not consist simply in the exhibition of a large number of cases of disease. Methods of examination are to be taught. The art of obtaining all of the subjective and objective symptoms, the modes of physical examination, the use of electricity, of the laryngoscope and of the ophthalmoscope, the application of the microscope and of chemical analysis to diagnosis, in a word all that belongs to the propædæutics of clinical study must be learned. This propædæutical clinical instruction, which is too much neglected, does not require a large number of patients and can not be satisfactorily imparted to a large class of students. After this careful clinical training, the larger metropolitan hospitals and clinics can be visited with advantage.

Granted then that the conditions for clinical instruction furnish no obstacle to the development of this medical school, there remain all of the advantages of association with the university.

Here are already established laboratories for all of the natural

sciences, the importance of which for the study of medicine has been emphasized. There are already admirable opportunities for the study of physiological chemistry, which, to the best of my knowledge, is nowhere else in this country so adequately represented.

Laboratories for studies and original investigations in anatomy, physiology, pathology, hygiene, and experimental therapeutics are needed. These above all are the medical subjects which can be cultivated nowhere more successfully than under university influences and in coöperation with other natural sciences. The atmosphere of a university town free from the distractions of a large city is most favorable for the scientific pursuit of these fundamental branches of medicine.

To reap the fruit of these advantages the medical department must receive large pecuniary aid. The Yale medical school has an honorable history; but it can not to-day attain the height of its endeavor or meet the demands for higher medical education without a considerable endowment.

In no other direction could this university expand with greater promise of usefulness and of renown than in the line of liberal support of the highest and most scientific medical education.



